REMARKS

The application has been reviewed in light of the final Office Action dated May 20, 2005. Claims 39-44 and 78-86 were pending. Claims 1-38 and 45-77 were previously canceled, without disclaimer or prejudice. By this Amendment, claims 39-44 and 78-86 have been canceled, without disclaimer or prejudice, and new claims 87-93 have been added. Accordingly, claims 87-93 are now pending, with claim 87 being the sole pending claim in independent form.

Claims 39-44 and 78-86 were rejected under 35 U.S.C. §112, first paragraph, as purportedly failing to comply with the written description requirement.

By this Amendment, claims 39-44 and 78-86 have been canceled.

Accordingly, withdrawal of the rejection under 35 U.S.C. §112 is requested.

Claims 39-42, 78 and 80-82 were rejected as purportedly anticipated under 35 U.S.C. §102(e) by or, in the alternative as obvious under 35 U.S.C. §103(a) over, U.S. Patent No. 6,372,041 to Cho et al. Claims 43 and 44 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Cho in view of U.S. Patent No. 5,714,006 to Kizuki.

By this Amendment, claims 39-44 and 78-86 have been canceled.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that new independent claim 87 is patentable over the cited art, for at least the following reasons.

This application relates to a GaN bulk crystal substrate comprising a slab of GaN single crystal. The GaN single crystal slab is produced by forming a molten flux of a volatile metal element in a pressurized reaction vessel confining therein the molten flux together with an atmosphere containing N (nitrogen), such that the molten flux includes Ga in addition to the volatile metal element, growing GaN in the form of a single crystal body in the molten flux, and supplying a compound containing N directly into the atmosphere in the reaction vessel from a

source located outside the reaction vessel. A GaN single crystal slab proced in such a manner has a substantially uniform composition of GaN in the thickness direction, which allows it to be used for a laser diode or light-emitting diode, for example. Claim 87 is directed to such a GaN bulk crystal substrate. In addition, a GaN bulk crystal substrate produced in such a manner can have a thickness exceeding 100 μm (claim 88).

Cho, as understood by Applicant, is directed to a technique for homoepitaxial growth of bulk crystal GaN. The technique of Cho includes growing a GaN nucleation layer as a susceptor, stabilizing the GaN nucleation layer, growing the bulk crystal GaN on the GaN nucleation layer, and removing the bulk crystal GaN from the susceptor.

Cho does not disclose or suggest, however, a bulk crystal substrate of GaN comprising a slab of GaN single crystal having a substantially uniform composition of GaN in a thickness direction of the slab, wherein the GaN single crystal slab is produced by forming a molten flux of a volatile metal element in a pressurized reaction vessel confining therein the molten flux together with an atmosphere containing N (nitrogen), such that the molten flux includes Ga in addition to the volatile metal element, growing GaN in the form of a single crystal body in the molten flux, and supplying a compound containing N directly into the atmosphere in the reaction vessel from a source located outside the reaction vessel. Claim 39 is directed to such a GaN bulk crystal substrate. In addition, a GaN bulk crystal substrate proced in such a manner can have a thickness exceeding 100 μm (claim 40), and a uniform GaN composition in the thickness direction, as provided by the claimed invention of claim 87.

A bulk crystal GaN grown according to the techniques of Cho simply would not have the substantially uniform composition of GaN in the thickness direction of the slab, as provided by the claimed invention.

Kizuki, as understood by Applicant, is directed to a technique for epitaxially growing a

III-V compound semiconductor layer.

Applicant does not find disclosure or suggestion in the cited art, however, of a bulk crystal substrate of GaN, comprising a slab of GaN single crystal having a substantially uniform composition of GaN in a thickness direction of the slab, wherein the GaN single crystal slab is produced by forming a molten flux of a volatile metal element in a pressurized reaction vessel confining therein the molten flux together with an atmosphere containing N (nitrogen), such that the molten flux includes Ga in addition to the volatile metal element, growing GaN in the form of a single crystal body in the molten flux, and supplying a compound containing N directly into the atmosphere in the reaction vessel from a source located outside the reaction vessel. Claim 39 is directed to such a GaN bulk crystal substrate. In addition, a GaN bulk crystal substrate proced in such a manner can have a thickness exceeding 100 μm (claim 40), and a uniform GaN composition in the thickness direction, as provided by the claimed invention of claim 87.

Since the cited art does not disclose or suggest each and every feature of the claimed invention, the cited art does not render the claimed invention unpatentable.

Accordingly, for at least the above-stated reasons, Applicant respectfully submits that independent claim 87 and the claims depending therefrom are patentable over the cited art.

In view of the amendment and remarks hereinabove, Applicant submits that the application is now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition.

The Office is hereby authorized to charge any fees that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is

respectfully requested to call the undersigned attorney.

Respectfully submitted,

Paul Teng, Reg. No. 40,837
Attorney for Applicant
Cooper & Dunham LLP
Tel.: (212) 278-0400